

$a = 5.56 \text{ lbs.} \pm 0.125$ (possible error).

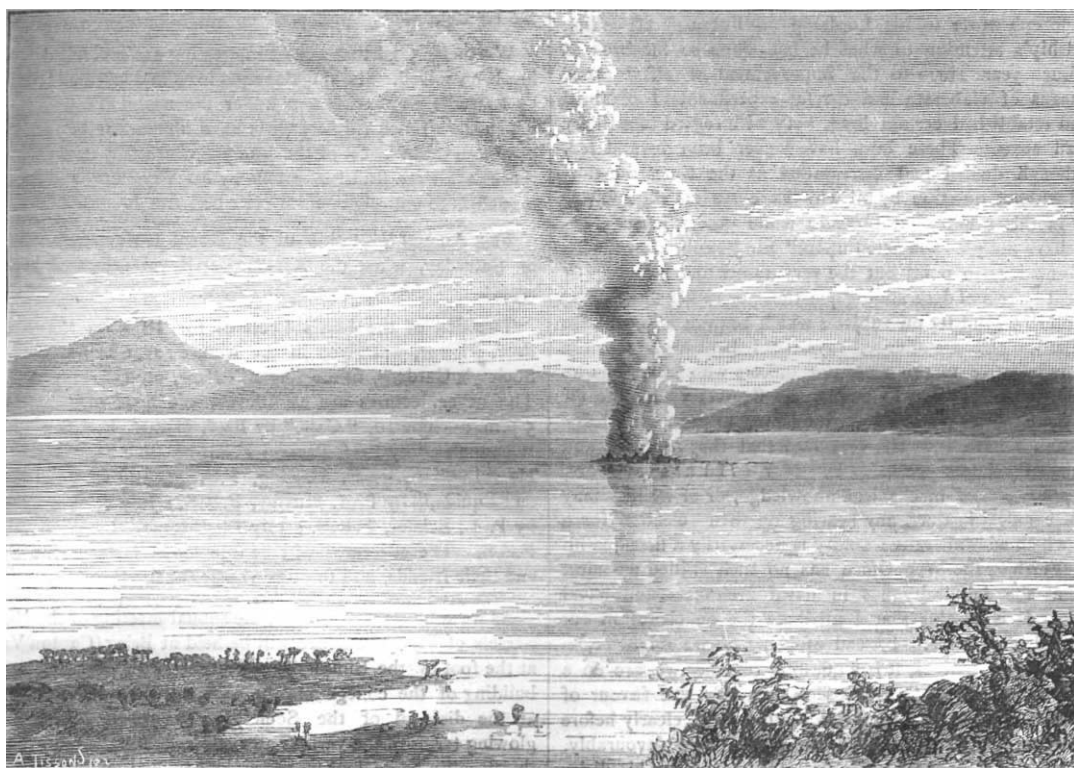
This result agrees closely with that calculated from the law of fatigue.

It should be added that a proposal was made by Dr. Houghton to Dr. Macalister to make the experiment conclusive by direct amputation of his scapula, a course which he, unreasonably, objected to, as he draws the line of "vivisection" at frogs.

A LACUSTRINE VOLCANO

IN a recent number of *La Nature* further details, furnished by the French Consul of San Salvador, M. J. Laferrière, are given concerning the recent volcanic phenomenon in Lake Ilopango in that State. The accompanying illustration, from a photograph, will show the nature of the crater which has risen in the midst of the

lake. Earthquakes were felt in San Salvador in the first half of January of this year; there were three strong shocks, less violent, however, than those of 1876. These earthquakes had their centre in the vicinity of Lake Ilopango, in the midst of which rose three volcanic openings connected with each other. This new crater, which, seen from a distance as in the illustration, appears a small islet, rises above the surface of the water, however, about twenty metres. An attempt was made to approach it in a boat, but the waters were all in a state of ebullition from contact with the burning rock, and gave off torrents of steam. An abundant column of smoke rose in the air, assuming the aspect of an immense cloud, which was seen from a great distance, and formed an imposing spectacle. The phenomenon was preceded by an exceptional rising of the lake, increased by the abundant winter rains. According to an old tradition the



Aspect of the Volcano in Lake Ilopango. (From a Photograph.)

Spaniards maintain that when the lake rises earthquakes are to be feared. Formerly, also, it was the custom to dig trenches to facilitate the escape of the waters. This practice was followed without intermission for a century, and volcanic phenomena did not appear during all that time. The present phenomena seem to justify this tradition.

If it is difficult to explain the fact it is still interesting to remember that a great number of volcanoes are submarine, that others are found for the most part in islands or in maritime regions, and that water may be one of the feeders of volcanic fires. Lake Ilopango, also known as Lake Cojutepec, is, according to M. Laferrière, a sunk crater. It is in the volcanic line, and it is a general fact in Central America that lakes alternate with volcanic cones. The water of this lake is brackish, very bitter, and almost viscous. It gives off sometimes, here and there, bubbles of sulphohydric acid gas. The lake is about 12 kilometres long by 16 broad; the depth is

unknown. It is about 12 kilometres from the city of San Salvador. The Consul of France in Guatemala, M. de Thiersant, states that Lake Ilopango has now a temperature of 38°C. on its shore, and is in complete ebullition round the volcano. All the fishes are cooked and float upon the surface, with a great number of shell-fish and other aquatic animals. The volcano continues to rise, and the level of the lake is being gradually lowered.

NOTES

THE candidates whose names we gave in a recent number (vol. xxi. p. 616) were elected Fellows of the Royal Society at the meeting of last Thursday. They are:—Dr. Clifford Allbutt, Prof. J. Attfield, Mr. H. E. Blanford, the Rev. W. H. Dallinger, Mr. Thiselton Dyer, Lieut.-Col. Godwin-Austen, the Bishop of Limerick, Prof. D. E. Hughes, Mr. H. M. Jeffery,

Prof. F. M'Coy, Mr. J. F. Moulton, Prof. C. Niven, Dr. J. Rae, Prof. J. E. Reynolds, Dr. W. A. Tilden.

IN the last number of the Berlin Chemical Society's *Journal* Prof. V. Meyer announces that he has been able to determine the density of iodine vapour at a considerably higher temperature than before, and that he has obtained values closely approximating to those required on the assumption that the gas then consists of *monatomic* iodine molecules. He proposes to extend his observations, if possible, to still higher temperatures, in order to ascertain whether the dissociation can be carried further; for this purpose he proposes to employ the recently described oil furnace of Deville and Troost, which is capable of fusing porcelain, and he hopes to be able to make use of vessels of graphite if those of porcelain are not sufficiently refractory.

FROM a copy of some correspondence which has passed between Sir Joseph Whitworth and Lord Beaconsfield, we see that Sir Joseph wrote to his Lordship on February 21, calling his Lordship's attention to what he had done so far back as twenty-four years since to the improvement of rifled arms.

"By means of elaborate and careful experiments I obtained facts, and established certain laws, both with regard to artillery and small arms. These laws have never been invalidated. Some, though denied and disregarded at the time, are now accepted without question by all who have studied the subject, not only in this country but abroad; while others, equally important, have not yet been acted upon." Sir Joseph, after stating that he is anxious to point out the very unsatisfactory nature of the present system of determining questions, or rather of advising the responsible Minister on subjects which require a knowledge of mechanics and metallurgy, says: "I believe I am not doing any injustice to the officer or officers who have, or who have had, for years past, to advise the Secretary of State for War in these matters, when I say they have no such knowledge—they cannot have it. The very fact that they are able and distinguished soldiers precludes it. Nor, as far as I am aware, has the possession of mechanical knowledge, or of what I may term a mechanical instinct, any bearing on their selection for a post for which administrative ability is necessarily a first qualification. Further, the War Office has no such skilled technical advisers as the Admiralty has in naval architects and naval engineers. It is to this that I attribute the deficiency in our artillery and small arms. Instead of being, as we might be, in advance of other nations, it is a question whether we are on a level with some of them." Sir Joseph then asks the favour of an interview, in order to bring this matter more clearly before Lord Beaconsfield, who received the request very favourably. Unfortunately, before Sir Joseph was able to carry out his disinterested intentions, he was compelled to leave the country on account of his health.

A NEW skating surface called "crystal ice" has been invented by Dr. Calantarients of Scarborough. Considering that after all ice is merely a crystalline substance, and that there is no lack of substances that are crystalline at ordinary temperatures, Dr. Calantarients experimented with a variety of salts, and after a time succeeded in making a mixture consisting mainly of carbonate and sulphate of soda, which, when laid as a floor by his plan, can be skated on with ordinary ice-skates; the resistance of the surface is just equal to that of ice, it looks like ice, and indeed when it has been skated on, and got "cut up" a little the deception is quite astonishing; a small experimental floor has been laid in the skating rink at Prince's, and has proved so successful that no doubt a large floor will be laid there or at some other convenient place in the autumn. This floor will obviously have great advantages, both over artificial ice floors, which are very expensive indeed, and over floors for roller-skating. The surface can at any time be made smooth again by

steaming with an apparatus for the purpose, and the floor itself when once laid will last for many years. It is interesting to observe that the mixture of salts used contains about 60 per cent. of water of crystallisation, so that after all the floor consists chiefly of solidified water.

MEMBERS of the General Committee and others who have not yet paid their subscriptions to the Clifford Testimonial Fund are requested to forward them to Messrs. Robarts, Lubbock, and Co., or to either of the honorary secretaries, Dr. Corfield, No. 10, Bolton Row, Mayfair, W., and Dr. Lee, No. 6, Savile Row, W.

IN our next number we shall give the first instalment of a paper by Drs. De La Rue and H. W. Müller, on some of their most recent Experimental Researches in Electricity. The second instalment of this paper will be accompanied by a fine plate illustrating the experiments, kindly furnished to us by Dr. De La Rue.

WE understand that a most interesting entomological problem has been solved. The singular aquatic animal originally described by Latreille as a crustacean under the name *Prosoptoma*, and which the French entomologists have affirmed to be the aquatic condition of an insect of the family *Ephemeridae*, has been traced through all its transformations by M. Vayssière, and the result is such as to entirely confirm their belief.

THE Annual Visitation of the Royal Observatory was made on Saturday, when the Astronomer-Royal presented his usual report.

THE first of the Davis Lectures for 1880, on "Teeth," by Prof. Flower, was given in the lecture-room in the Zoological Society's Gardens, in the Regent's Park, on Thursday last week. The other lectures are as follows, the hour of lecture being 5 p.m.:—June 10, "Cats," by Prof. Mivart, F.R.S.; June 17, "Tadpoles," by Prof. Parker, F.R.S.; June 24, "Hawks and Hawking," by J. E. Harting, F.Z.S.; July 1, "Cuttle-fishes and Squids," by Prof. Huxley, F.R.S.; July 8, "Waterfowl," by P. L. Slater, F.R.S.; July 15, "Birds," by W. A. Forbes, F.Z.S. These lectures will be free to Fellows of the Society and their friends, and to other visitors to the Gardens.

As we announced last week, the annual meeting of the Helvetic Society of Natural Science will be held at Brieg (Canton Valais), at the foot of the Simplon, on September 12 to 15. The great building of the college and the palace of Baron Stockalper are at the disposal of the Society. The committee speak in glowing terms of the various attractions which will be found in this locality by geologists, mineralogists, and entomologists, the "generous wine of Valais" being not the least among the attractions promised to botanists.

THE twelfth meeting of the Scandinavian Naturalists and Physicians will take place at Stockholm on July 7 to 14 inclusive. A numerous attendance is expected from Denmark and Norway, as well as from other countries.

A LARGE German Horticultural Exhibition is planned for the summer of 1882. It will be held at Bremen in connection with the twenty-fifth anniversary of the foundation of the Horticultural Society of that city.

It is believed that the engineers of the St. Gothard Tunnel will be able to overcome the difficulty arising from the threatened collapse of the passage in the part known as the "Windy Stretch." According to Prof. Colladon, the strata in this section are composed of a calcareous aluminous schist, which has a great affinity for moisture, and swells enormously on exposure to the air. If a tunnel were made through Mont Blanc, 3,000 mètres of similar material would have to be pierced and vaulted.

M. BRESSE has been elected to fill the place vacated by the death of General Morin in the Section of Mechanics of the Paris Academy of Sciences.

THE Vesuvius railway was opened on the 6th inst. with much ceremony. It was found to work with perfect satisfaction.

AN experiment with Jamin's electric candle was made on a large scale at the works of the Compagnie Générale d'Electricité, 67, Avenue du Marine, Paris, on June 3. About 1,900 people had been invited, amongst them the principal authorities of the French Republic. The light was found steady, but it remains to be seen whether the expense is smaller than with other systems, and the apparatus can work during a series of days. The candles are moved by a combination analogous to Wild's patent. The weight of wire utilised for each of these frames is 600 to 700 grammes, which shows a length of about 80 metres. M. Jamin wants tension for working his candles, and his Gramme machines rotated with a very great velocity. The scene was very picturesque and the general impression was good, although not enthusiastic, as has been reported in several political papers.

THE Swiss Naturalists Association have decided to erect the Meteorological Observatory, the establishment of which was recommended to them by the International Meteorological Congress which met at Rome last year, upon the Säntis Mountain, in the canton of Appenzell. This peak is better adapted for the purposes of meteorological observation than any other one in Switzerland, on account of its comparatively isolated position. The observatory will cost about 320%, besides which 360% will be spent annually for its maintenance and staff.

MR. G. H. KINAHAN writes us that a wooden hut has been discovered lately under sixteen feet of bog by Thos. Plunkett, M.R.I.A., of Enniskillen. It is remarkable that this structure is at the same depth as the similar structure found at Drunkelin, and described by Wilde in the Catalogue of the Royal Irish Academy.

A LARGE crowd is attracted every night to the Palais de l'Industrie, Paris, where are burning regularly 400 Jablockhoff lights, on the occasion of the Exposition des Beaux Arts, a floral exhibition having taken place in the nave from June 1 to 10, the scene in the nave surpassing description.

ELECTRIC light experiments on a large scale will be conducted with Wild candles at the Universal Exhibition of Melun. The gardens will be opened every night and lighted by electricity.

AN international exhibition was opened at Brussels on June 1 by the king. It is a private speculation, which must not be confounded with the national exhibition which will be opened on June 19, and is the only official display in the capital of Belgium.

M. MARCHE has invented in Paris a new telephone, which he calls electrophone, and which works with an induction coil. The induction current is sent from a distance which is said to be very large, and the hearing is said to be satisfactory.

M. CAILLERET, a telegraphist of Lille (Nord), discovered a new method of rotating the electro-magnetic gyroscope with any induction coil. It is to employ the thin wire as an inductor, and the thick one for sending the induction current to the coil.

A PROSPECTING party, despatched by the Queensland Government, is stated to have discovered a very rich gold-field on the Sefton River in the north of the colony. An examination of the country along the east coast of Cape York Peninsula has not, however, proved successful.

It is stated that at Wickham, about 100 miles south of Sydney, New South Wales, two surface bands of metallic stone of considerable width have just been discovered. On analysis it is found that there is a large amount of gold and silver in one of these, while the other contains over 60 per cent. of iron with traces only of gold. A large and enormously valuable diamond is also said to have been discovered in the same locality.

THE Naples correspondent of the *Daily News* states that twelve miles south of Sciacca, on the coast of Sicily, an exceedingly rich bank of corals has been discovered, which is even more important than the one found in 1876 in the same waters.

MR. DAVID BOGUE has now at press and will shortly publish a new work, viz., "Birds, Fishes, and Cetacea of Belfast Lough," by Mr. R. Lloyd Patterson, vice-president of Belfast Natural History Society, and president of Belfast Chamber of Commerce, son of the late Robert Patterson, F.R.S. The book will form an interesting and valuable addition to this branch of natural history.

A TERRIBLE forest fire took place in the Harz Mountains on May 27 last. The whole forest of the Great Jügelberg, near Goslar, is destroyed.

THE forty-fourth general meeting of the Saxon and Thuringian Natural History Society took place at Nordhausen on May 18 and 19 last. The Society numbers between 300 and 400 members.

THE nights of May 18 and 19 were fatal to almost all vineyards on the banks of the Rhine and its tributaries. The young shoots on most of the vines were killed by the frost, which was intense.

AN interesting novelty in the German book-market is "Upilio Faimali, Memoiren eines Thierbändigers," collected by Paul Mantegazza. It is published by Winter, of Heidelberg. Faimali was one of the few tamers of wild animals who gained universal reputation. The book contains interesting narratives of his numerous adventures with various beasts.

ON May 11 last the statue of the late M. Quetelet was unveiled in the gardens of the Brussels Academy buildings. He is represented in a sitting posture, his left hand rests upon a large celestial globe, and he holds a pen in his right. The expressive features are said to be an excellent likeness.

A CURIOUS survival of mediæval superstition has cropped up in a rumour which obtains credence in the West of England, that Balmain's luminous paint is prepared with *human fat*, in order to give it its phosphorescent properties!

ON the Schleswig coast in the Little Belt the establishment of oyster beds is engaging the active attention of the authorities. One million and a half of small oysters have been "sown out" between the Gjenner Bay and the Danish frontier near Heilsmünde.

OUR ASTRONOMICAL COLUMN

WINNECKE'S COMET.—In No. 2,314 of the *Astronomische Nachrichten* Prof. v. Oppolzer has a note of more than ordinary interest on the motion of this body as investigated by his own calculations. He states that it results from his computation of the perturbations with the object of connecting the three appearances of 1858, 1869, and 1875 that a satisfactory agreement cannot be found without one of two hypotheses; either the mass of Jupiter must be diminished to $\frac{1}{10}$ of its present value, or there is a necessity of admitting the existence of a similar extraordinary influence upon the motion of this comet to that first pointed out by Encke in the motion of the comet which bears his name. Prof. Oppolzer finds an acceleration in the mean daily sidereal motion of 0".01439 after one revolution, a result which, he remarks, is in close accordance with his earlier one, deduced by a provisional calculation of